Homework (due on Nov 6)

1. Use the data set "LapseData201410.csv". The column names are self-explanatory.
   1. Build a GLM model with binomial distribution and Poisson distribution. Please include R scripts and output of your codes.
   2. Compare the model results, and explain the difference.
   3. If you are asked to recommend one, indicate which one is preferred. Support your conclusions with statistic measurement, and business reason if applicable.

   Hint: select proper offset and weights, dependent on your target variable.

2. On 28 January 1986, the Space Shuttle *Challenger* broke apart, 73 seconds into flight. All seven crew members died. The cause of the disaster was the failure of an O-ring on the right solid rocket booster. (O-rings help seal the joints of different segments of the solid rocket boosters.) It is now known that a leading factor in the O-ring failure was the exceptionally low temperature (about 31° F) at the time of the launch.

   The table below gives the temperature T (° F) and O-ring damage index for 23 Space Shuttle launches. The damage index is a severity-weighted total number of incidents of O-ring erosion, heating, and blow-by.

   Build a logistics model to model the damage index as a function of temperature. Predict the O-ring damage index at the temperature 31° F, and explain the Challenger disaster.

   (You can assume that 20 is the maximum damage index)

Temperature	Damage Index
53	11
57	4
58	4
63	2
66	0
67	0
67	0
67	0
68	0
69	0
70	4
70	0
70	4
70	0
72	0
73	0
75	0
75	4
76	0
76	0
78	0
79	0
81	0